

5      **METHODS OF FORMING ALPHA AND BETA TANTALUM FILMS  
         WITH CONTROLLED AND NEW MICROSTUCTURES**

**ABSTRACT OF THE INVENTION**

         Thin tantalum films having novel microstructures are provided.  
The films have microstructures such as nanocrystalline, single crystal and  
10    amorphous. These films provide excellent diffusion barrier properties and are  
useful in microelectronic devices. Methods of forming the films using pulsed  
laser deposition (PLD) and molecular beam epitaxy (MBE) deposition methods  
are also provided, as are microelectronic devices incorporating these films.